Low-Water Cutoffs

A low-water cutoff is a device that electrically shuts off the fuel supply when the water level falls below a predetermined level. The float-type cutoff is the most common, but electrodes and differential pressure transmitters are also in use. It's common practice to install two low-water cutoffs, one positioned slightly lower than the other. The highest cutoff is the primary, the lower is the backup. The primary cutoff is usually the type that resets itself after the boiler recovers from a low-water condition. That is, it lets the boiler restart automatically without the operator's intervention. The backup is always the type that must be reset manually. When the backup low-water cutoff has to be reset, this indicates that the first cutoff failed to shut off the burner and the backup was used instead. The failure of the primary cutoff must be investigated and repaired.

Figure 3-6a shows low-water cutoffs in which a float positions a lever, which activates switches. The wet and electrical parts are separated by a packless bellows seal or are linked by a magnetized activated switch. Figure 3-6b shows the probe-type low-water cutoff, which works according to the principle that water conducts electricity much better than steam. When water covers or uncovers the tip of an electrode, a relay coil is either energized or de-energized. Depending on the make and model, the switches can sound an alarm for high- or low-water conditions, shut off the fuel during low-water conditions, and/or control a pump to maintain proper water level.